

# First report of Western Flower Thrips, *Frankliniella occidentalis* (Pergande) (Thripidae: Thysanoptera) from India- A Potential Havoc to Indian agriculture

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## Abstract

Western Flower thrips (WFT), *Frankliniella occidentalis* (Pergande) is being reported for the first time from India based on specimens collected on tomato. It is the most economically important species in the insect Order Thysanoptera damaging wide variety of crops as a sucking pest and vector for plant viruses.

**Key words:** WFT, pest, vector, new record, India.

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## Introduction

Western Flower thrips (WFT), *Frankliniella occidentalis* (Pergande) is highly polyphagous and the most destructive pest species in the order Thysanoptera (Mound, 2002). WFT causes direct feeding damage to a wide variety of agricultural and horticultural crops across the globe (Rugman-Jones et al. 2010). Apart from direct feeding damage, WFT is one of the important vector of tospoviruses (family Bunyviridae, genus Tospoviruses) causing high economic loss worldwide (Wijkamp et al. 1995). So far, fourteen species of thrips have been reported as vectors for tospoviruses. Out of these fourteen species, *F. occidentalis* is responsible to transmit as many as five species of tospoviruses (Riley et al. 2011). At present, data on exact economic loss caused by WFT is not available. However, Rugman-Jones et al. (2010) has reported that WFT transmitted Tomato spotted wilt virus (TSWV) alone cause >\$1billion economic loss worldwide in early 1990s. The species has been identified using available taxonomic key (Mound and Marullo, 1996, Cavalleri & Mound, 2012).

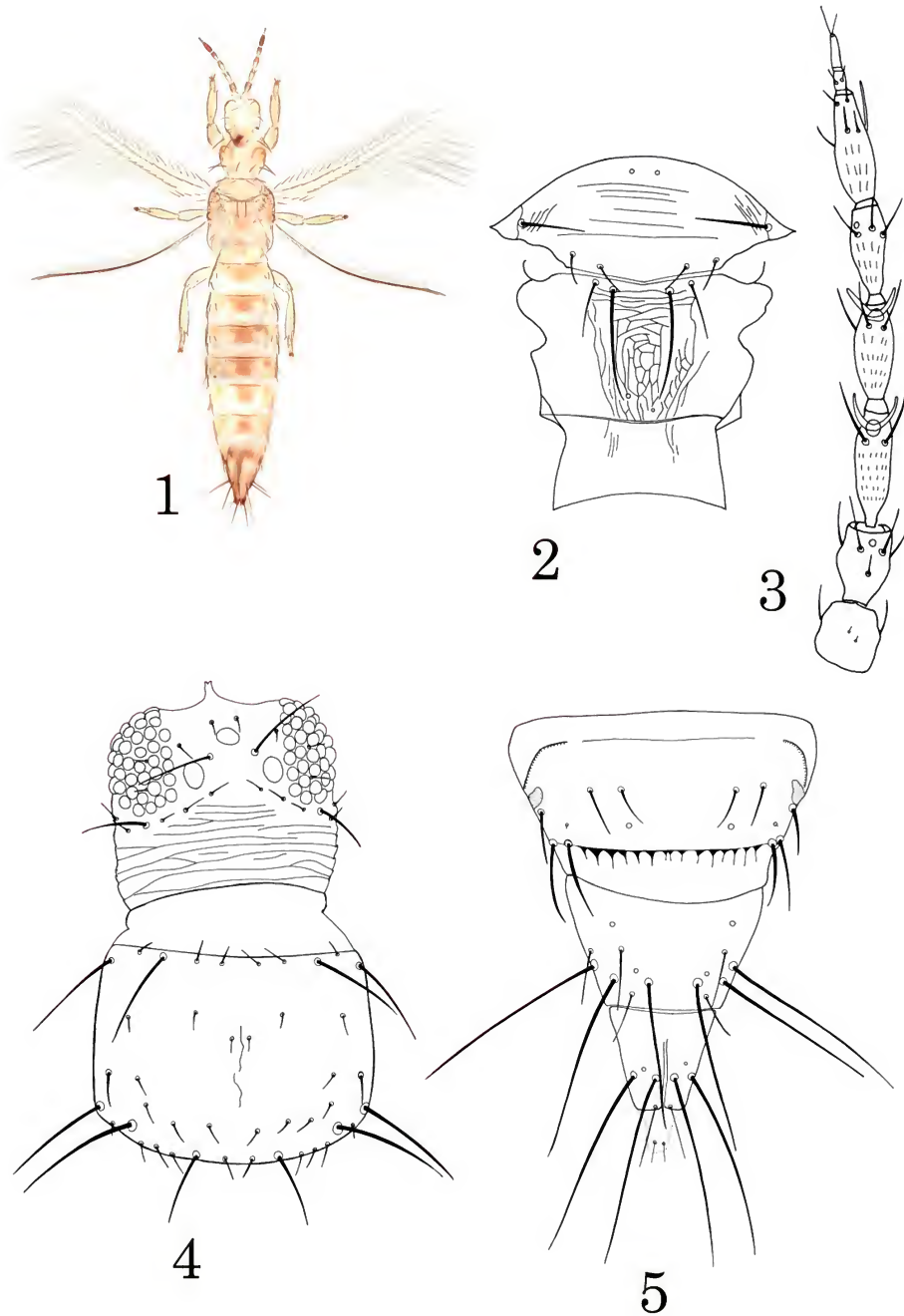
The objective of this paper is to report the first record of *Frankliniella occidentalis* from India. Earlier report of this species from India (Kulkarni, 2010) has been found unreliable (EPP0, 2013). The presence of this economically important species in India is a serious problems and a concern for quarantine authorities. Considering its

economic importance as a serious pest and vector of tospoviruses, occurrence of *F. occidentalis* in other parts of India need systematic monitoring.

## *Frankliniella occidentalis* (Pergande)

### (Figs. 1-5)

**Female macroptera:** Body pale yellow with brown patches on abdominal tergites; legs yellow antennal segments I yellow, II brown III yellow with brown shade at apex, IV–V yellow basally and brown apically, VI–VIII brown; fore wings shaded (Fig. 1). Head with transverse lines of sculpture; three pairs of ocellar setae present, pair III well-developed and arising between parallel tangent of fore and hind ocelli; six pairs of fine postocular setae, pair IV distinctively longer than others (Fig.4). Eyes without pigmented facets. Antennae 8-segmented, segments III and IV each with a forked sense cone; pedicel of segment III simple (Fig.3). Pronotum with four small setae between the major anteromarginal setae. Mesonotum with faint transverse line of sculpture, anteromedian campaniform sensilla present. Metanotum with irregularly reticulate posteromedially; paired campaniform sensilla present; two pairs of setae arising at anterior margin (Fig.2). Fore wings with two complete rows of setae. Abdominal tergite VIII with irregular comb of microtrichia; S1 setae on IX longer than tergite X (Fig.5).



**Figures 1–5. *Frankliniella occidentalis*. 1. Whole insect, female; 2. Meso-metanota; 3. Antenna; 4. Head & pronotum; 5. Tergites VIII–X.**

**Material studied.** India, Karnataka, Bangalore, 4 females, 2-xi-2014, tomato plantation, Vikas (Reg. No. 5961/H17 to 5964/H17). All specimens have been deposited in the National Zoological Collections (NZC), Zoological Survey of India, Kolkata, India.

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#### References

- Cavalleri, A. and Mound, L.A. 2012. Toward the identification of *Frankliniella* species in Brazil (Thysanoptera, Thripidae). *Zootaxa* 3270: 1-30.
- EPPO, 2013. PQR database. Paris, France: European and Mediterranean Plant Protection Organization. <http://www.eppo.int/DATABASES/pqr/pqr.htm>
- Kulkarni, H. D. 2010. Little leaf disease of eucalyptus by thrips, *Frankliniella occidentalis* (Pergande). *Karnataka Journal of Agricultural Sciences* 23(1):203-206.
- Mound, L.A. 2002. So many thrips—so few Tospoviruses. In: Marullo R., Mound LA., (eds.). pp. 3–6. Thrips and Tospoviruses: Proceedings of the 7th International Symposium of Thysanoptera. Australian National Insect Collection, Canberra.
- Mound, L.A. and Marullo, R. 1996. The thrips of Central and South America: An introduction. *Memoirs of the American Entomological Institute* 6: 1-486.
- Rugman-Jones, P.F., Hoddle, M.S. and Stouthamer, R. 2010. Nuclear-mitochondrial barcoding exposes the global pest western flower thrips (Thysanoptera: Thripidae) as two sympatric cryptic species in its native California. *Journal of Economic Entomology* 103: 877–886. DOI: 10.1603/EC09300.
- Riley, D., Shimat, J., Srinivasan, R. and Diffie, S. 2011. Thrips vectors of tospoviruses. *Journal of Integrated Pest Management* 1(2): 1-10. DOI: 10.1603/IPM10020.
- Wijkamp, I., Almarza, R., Goldbach, R. and Peters, D. 1995. Distinct levels of specificity in thrips transmission of tospoviruses. *Phytopathology* 85: 1069-1074.